SECTION 607 – FENCES

Description

1.1 This work shall consist of the constructing, removing and resetting railings, fences, and gates as shown on the plans or as ordered. This work shall include furnishing and installing the required electrical grounds.

Materials

2.1 Woven Wire Fence.

2.1.1 Wire shall conform to ASTM A 116, Design No. 1047-12-11. Minimum coating shall meet Class 1.

2.1.2 Steel posts and angle braces shall conform to ASTM A 499 and A 702. Posts shall be galvanized in accordance with AASHTO M 111. Fittings, hardware and other appurtenances not specifically covered by the plans and specifications shall be standard commercial grade, manufactured in accordance with current standard practice.

2.1.3 Tie wires and wire clips shall be of equivalent size and coating as specified in 2.1.1.

2.1.4 Gates. Gate posts shall conform to 2.1.2. Wire shall conform to 2.1.1. The frame, center brace, diagonal tension rod, and hardware shall conform to the standards shown on the plans.

2.2 Chain Link Fence.

2.2.1 Chain link fence shall conform to AASHTO M 181.

2.2.2 Unless otherwise stipulated, fencing material shall be 9 gauge, 2 in. (3.76 mm, 50 mm) mesh, Type II or Type IV fabric. The specific diameter for Type IV fabric is the metallic coated diameter and the PVC coating shall not be used when determining wire size. All vinyl-coated fabric used on the project shall be the same shade of color called for in the plans.

2.2.2.1 Fabric up to and including 60 in. (1.5 m) high shall be knuckled at the top and bottom selvages. Fabric over 60 in. (1.5 m) high shall be twisted and barbed on the bottom selvage and knuckled on the top selvage.

2.2.3 Metallic coated steel posts, rails, or gate frames shall conform to AASHTO M 181 Grade 1 or Grade 2. Miscellaneous fittings and hardware shall conform to AASHTO M 181 Section 29.

2.2.4 Tension bars shall not be less than 0.25 by 0.75 in. (6 by 19 mm).

2.2.5 Wire ties and clips for fastening fabric to posts and top rail shall be of the same material and the same or larger gauge as the fabric.

2.3 Barbed wire. Barbed wire, unless otherwise specified, shall be fabricated from 2 ply 12-1/2 gauge (2.51 mm), Class 3 zinc-coated steel wire, with 14 gauge (2.03 mm) 4-point barbs spaced not more than 5 in. (130 mm) apart, and shall meet the requirements of ASTM A 121.

2.4 Additional materials required for resetting railings or fencing or both shall conform in quality and type to the materials in the existing fence.

2.5 Concrete shall conform to 520.

2.6 Protective coating for contact surfaces of aluminum and concrete shall be either an approved zinc-rich primer, or an approved bituminous paint meeting FSS TT-C-494.

Construction Requirements

3.1 General.

3.1.1 The Contractor shall perform such clearing and grubbing as may be necessary to construct the fence to the required grade and alignment.

3.1.2 At locations where breaks in a run of fencing are required, or at intersections with existing fences, appropriate adjustment in post spacing shall be made.

3.1.3 The fence shall be permanently connected to the existing fence as shown in the plans or as approved by the Engineer.

3.1.4 Posts, braces, or anchors shall be embedded in concrete and temporary guys or braces may be required to hold the posts in proper position until such time as the concrete has set sufficiently to hold the posts. Unless otherwise permitted, no materials shall be installed on posts or strain placed on guys and bracing set in concrete until 3 days have elapsed from the time of placing of the concrete.

3.1.4.1 The portions of aluminum posts which will be in contact with concrete shall be coated both inside and outside with protective coating to 1 in. (25 mm) above the top of the concrete. The coating shall be allowed to dry for at least 24 hours before the concrete is placed.

3.1.4.2 In wet areas, when it is impractical to place concrete, steel drive anchor assemblies may be required.

3.1.5 All posts shall be set plumb and firm and to the required grade, spacing, and alignment. Cutting of the posts will be allowed only with the approval of the Engineer.

3.1.6 When it is necessary to drill into rock to set a steel post, the post may be shortened, provided a minimum length of 12 in. (300 mm) of post is grouted in the rock.

3.1.7 At each location where an electric transmission, distribution, or secondary line crosses any of the types of metal fences covered by these specifications, the fence shall be grounded as required by the electric utility company.

3.1.7.1 At locations where electric lines run parallel and in close proximity to metal fences, grounding systems may be required by the electric utility company.

3.1.8 Where it is impractical to conform the fence to the general contour of the ground, as at ditches, the opening beneath the fence shall be closed as ordered.

3.1.9 All surplus material and other debris shall be removed.

3.2 Woven Wire Fence.

3.2.1 The wire shall be stretched so that not more than 1/2 of the hump is removed from the horizontal wire. The top and bottom wire and alternate parallel interior wires shall be fastened at every post in such a manner that each interior wire shall have a fastening at every other post.

3.2.1.1 Runs of woven wire fence 600 ft. (180 m) or less in length shall be erected with not more than one splice between post assemblies. Except as otherwise provided, splicing the wire will be permitted at posts only. Each horizontal strand of wire shall be wrapped completely around posts at post assemblies and shall be securely fastened by winding the end of the wire about the same strand where it leads up to the post. Other devices designed specifically to splice fencing wire may be used when approved. Post assemblies shall be constructed at all corners, ends, gates, at extreme sags or humps in grade, and at ends of 600 ft. (180 m) lengths of fencing.

3.3 Chain Link Fence.

3.3.1 The fence shall be erected so that the bottom is between 1 and 2 in. (25 and 50 mm) above the ground.

3.3.1.1 The top rail shall pass through the post tops to form a continuous brace from end to end of each section of fence, and shall be securely fastened to the posts at post assemblies by suitable clamps.

3.3.1.2 Post assemblies as shown on the plans shall be installed at ends, at corners or changes in line where the angle of deflection is 30 degrees or more, at abrupt changes in vertical grades where pull posts are required, and at gates. Moreover, at least one post assembly shall be installed for every 500 ft. (150 m) of run.

3.3.1.3 Braces shall be spaced approximately midway between the top and the ground, and extend to the first line post. Braces shall be securely fastened to posts by suitable clamps.

3.3.1.4 Truss rods shall be installed as shown on the plans.

3.3.2 Unless otherwise shown on the plans, when barbed wire is required, arms shall be installed outward.

3.3.3 Fabric shall be fastened to the post with suitable fabric bands, stretcher bar bands, and hook bolts and to the top rail with tie wires as shown on the plans. The fabric shall be free from sags and bends.

3.3.4 All holes within 2 ft. (600 mm) of the fence shall be filled with suitable approved material and compacted properly.

3.4 Temporary fence. Fences holding livestock shall be promptly replaced by temporary fencing, with no extra compensation, during the time between the removal of the old fence and the erection of the new fence. Fencing meeting the specifications for the project may be used in its permanent location after having been used as temporary fence provided the fencing has not been damaged.

3.5 Gates. Gates shall be firmly and securely erected in accordance with the recommendations of the manufacturer and as directed.

3.6 Resetting. The existing railing or fencing shall be carefully removed, transported and reset at the required location. The reset railing or fencing shall be at least equivalent in strength and appearance to the original railing or fencing. Additional materials such as fittings or hardware shall be furnished and installed as necessary.

3.7 Barbed wire. The installation of barbed wire along the right-of-way is not allowed (see RSA 236:15).

Method of Measurement

4.1 All fence, new or reset, will be measured by the linear foot (linear meter), to the nearest 0.1 of a foot (meter). Measurement will be along the top of the fence for each continuous run.

4.1.1 Woven wire fence and chain link fence will be measured from center to center of end posts or gate posts as the case may be.

4.1.2 Railing reset will be measured from end to end of rail.

4.2 Post assemblies of the kind specified will be measured by the number of units. A unit shall consist of the post and all its required hardware and anchorages.

4.3 Gates will be measured as complete units of the size and type specified.

Basis of Payment

5.1 The accepted quantities of fencing of the type specified and of the height required will be paid for at the Contract unit price per linear foot (linear meter), complete in place. This unit price shall include the cost of furnishing all labor, tools and equipment to satisfactorily complete the work and shall include excavation, concrete or steel drive anchor assemblies, posts, hardware, fencing and any repair of material damaged by the Contractor's operation. Gates and post assemblies, complete in place, shall be paid for as units. Clearing necessary to provide space for erecting the fencing will be paid for as provided under Item 201.6.

5.1.1 Removing existing fence lines within 1 ½ feet of the centerline of the new fence shall be subsidiary to the fence item.

5.2 The accepted quantity of railing or fencing reset will be paid for at the Contract unit price per linear foot (linear meter) complete in place, except that the cost of furnishing additional materials, including new post concrete embedment, required through no fault of the Contractor will be paid as provided for in 109.04. Removing old concrete embedment from the posts will be subsidiary to the resetting item.

Pay items and units :

607 .A BC DE — Item Number
.A — Type of Fence — Linear Foot (Linear Meter)
1 = Woven Wire Fence
2 = Chain Link Fence with Aluminum Coated Steel Fabric
3 = Chain Link Fence with Vinyl Coated Steel Fabric
8 = Miscellaneous Fence Types (Iron, Barbed Wire, etc.)

BC — Height of Fence (Feet & Inches (m), 10'+ use 1)
DE — Width of Gate, (Feet & Inches (m), 10'+ use 1)

607.4B CD — 4 = Post Assemblies — Each
B — Type of Fence
1 = Woven Wire Fence
2 = Chain Link Fence with Aluminum Coated Steel Fabric
3 = Chain Link Fence with Vinyl Coated Steel Fabric
8 = Miscellaneous Fence Types (Iron, Barbed Wire, etc.)

CD — Height of Fence

607.5B CD — 5 = Wood Fence — Linear Foot (Linear Meter)
B — 1 = Stockade Screen
2 = Shadowbox
3 = Railing

CD — Height of Fence

607.6B C DE — 6 = Single Gate — Unit
607.7B C DE — 7 = Double Gate — Unit

B — Type of Fence
1 = Woven Wire Fence
2 = Chain Link Fence with Aluminum Coated Steel Fabric
3 = Chain Link Fence with Vinyl Coated Steel Fabric
5 = Wood Fence
8 = Miscellaneous Fence Types (Iron, Barbed Wire, etc.)

C — Height of Fence (Feet & Inches 10'+ use 1)
DE — Width of Gate

607.9B	CD	9 = Resetting (includes gate)	Linear Foot (Linear Meter)
		Type of Fence	
	B	1 = Woven Wire Fence	
		2 = Chain Link Fence with Aluminum Coated Steel Fabric	
		3 = Chain Link Fence with Vinyl Coated Steel Fabric	
		7 = Wood Fence	
		8 = Miscellaneous Fence Types (Iron, Barbed Wire, etc.)	
	CD	Height of Fence	

Examples:

607.146	Woven Wire Fence 4'-6" High	Linear Foot
607.4308	Post Assemblies for Chain Link Fence with Vinyl Coated Steel Fabric, 8' High	Each
607.5124	Stockade Screen, 2.4 M High	Linear Meter
607.72824	Double Gate Chain Link Fence with Aluminum Coated Steel Fabric, 24' Wide X 8' High	Unit
607.9304	Resetting Chain Link Fence with Vinyl Coated Steel Fabric, 4' High	Linear Foot